Picture shown may not reflect actual configuration

Cat® ATC-900 ATS Controller

The ATC-900 offers adaptable programming and supervisory capability to the Cat® family of transfer switches. Flexible controls allow the ATC-900 to address virtually any system requirement. Typical applications include utility-to-utility, utility-to-generator, and generator-to-generator transfer pairs. Three-source system are also supported. Transition options include open, in-phase, delayed or closed transition.

An illuminated alphanumeric LED display combined with touch sensitive function and navigation buttons provide an enhanced local user interface for programming and data access. The controller includes an on-board USB port for upload of setpoints and download of event logs, and remote connectivity is supported via Modbus® communication.

Features

• 4.3-inch color TFT LCD display

• True RMS three-phase voltage sensing of both sources and load

• Frequency sensing of both sources and load

• Event logging and recording of 320 time-stamped events

• Assignable I/O

• USB drive upload/download

• Password protection

• Integrated help button and menu

• Voltage unbalance and phase rotation sensing

• Optional Load Current, kW, kVAR, KVA and PF

• CSA® and European standards Conformance

Primary Functions

• Monitor normal and emergency source voltages and frequencies

• Provision of transfer & re-transfer control signals

• Provision of engine/generator start and shutdown signals

• Permit user programming of set points

• Display real time and historical information

• Permit system testing

• Store all parameters in nonvolatile memory

• Provide at-a-glance source status indication

ATC-900 Controller Features

Hardware	
4.3-inch color TFT LCD display	S
UV-resistant faceplate	S
Mimic diagram and LED status indicators	S
Help function for detailed description of displayed message	S
Password protected system test pushbutton	S
Bypass time delay pushbutton	S
Form-C engine start contact for Source 1 and Source 2	S
S1 and S2 available Form-C contacts	S
Self-diagnostic and system diagnostic functions with LED	S
DC power input	O
Metering	
True rms voltage sensing of Source 1, Source 2, and Load	S
Frequency sensing of Source 1, Source 2, and Load	S
Voltage unbalance and phase rotation sensing	S
Load current sensing	O
Sampling at 64 samples per cycle	O
Source 1 voltages (3Φ)	S
Source 2 voltages (3Φ)	S
Load voltages (3Φ)	S
Source 1 frequency	S
Source 2 frequency	S
Load frequency	S
Load currents (3Φ)	O
Load kW	O
Load kVAR	O
Load kVA	O
PF	O
Programming	
Programmable set points stored in nonvolatile memory	S
System monitoring with historical data storage and display	S
Digital set points for accurate and consistent performance	S
Password-protected access to control functions and set point	S
4 programmable control inputs	S
4 programmable control outputs	S
Expandable I/O modules (up to 20 I/O total)	O
Automatic plant exerciser—two plant exerciser schedules, Off, daily, 7-day, 14-day, 28-day, calendar, separate TDNE, TDEN, TDEC timers from normal operation, control input provided for remotely initiating an engine test	S
Communications	
Modbus RTU	S
Modbus TCP/IP	O
USB port for set point configuration and event-recording	S
Event history	
320 time-stamped events	S
2 seconds of metered data stored before and after a transfer	O

S: standard   O: optional

ATC-900 Technical specifications

Parameter	Specification
Control power	120 Vac (50/60 Hz) (operating range 65–160 Vac) or 24 Vdc (±10%) with DCT module
Power consumption	18 VA
Environmental conditions	
Operating temperature	-4.0–158F (-20–70ºC)
Operating humidity	Up to 90% relative humidity (non-condensing)
Enclosure compatibility	NEMA 12 (standard mounting) NEMA 4/4X (mounted with gasket between panel and device faceplate) NEMA 3R (outdoor)
System voltage application	120–600 Vac (50/60 Hz) (single or three phase)
Voltage measurements	Source 1, Source 2 and Load (VAB, VBC, VCA for three-phase system)
Voltage measurement range	0–700 Vac
Voltage measurement accuracy	±1% of reading (L-L)
Frequency measurements	Source 1 and Source 2
Frequency measurement range	40–80 Hz
Frequency measurement accuracy	±0.1 Hz
Applicable testing	UL® recognized component 2009 IBC, 2010 CBC certified in ATS assemblies Complies with UL 991 environmental tests Complies with IEC 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, and 61000-4-6 Complies with CISPR 11, Class A Complies with FCC Part 15, Subpart B, Class A
CSAT conformance	C22.2 No. 178-1978 (reaffirmed 1992)
CE mark	European standards conformance

LEHE0833-01

Automatic Transfer Switch

Optional Metering Via DCT

The addition of the DCT module mounted directly to the back of the ATC-900 controller allows the incorporation of a current transformer interface. This addition allows for metering of current and power and expands the voltage and frequency metering capabilities as follows:

Voltage inputs (measurement category)
- Range: universal, auto-ranging up to 416Vac L-N, 721 Vac L-L
- Supported hookups: 3-Element Wye or Delta
- Input Impedance: 2m Ohm/phase
- Burden: 0.0022 VA/phase at 120V
- Fault Withstand: meets IEEE® C37.90.1

Current inputs
- 5A nominal, 10A maximum
- Burden: 0.005VA per phase maximum at 11A
- Pickup current: 0.1% of nominal
- Connections: Screw terminals
- Max input wire gauge: AWG #12/2.5 mm 2
- Fault withstand: 100A/10 seconds, 300A/3 seconds, 500A/1 second

Isolation
- All inputs are isolated to 2600 Vac

Measurement methods
- Voltage, current: true RMS
- Power: sampling at 64 samples per cycle on all channels measured readings simultaneously
- A/D conversion: 16 simultaneous 12 bit analog to digital converters

DCT Metering Data			
Type (units)	Value	Accuracy	Notes
Current (Amperes)	IA, IB, IC	+/- 1% of reading	
Voltage (Volts)	VAB, VBC, VCA	+/- 1% of reading	Line to Line
Frequency (Hz)	Frequency	+/- 0.2% of reading	Range is 20-255 Hz
Power (kW)	Power	+/- 2% of reading	Approx. 1 second update
Real Power (kVA)	Real Power	+/- 2% of reading	Approx. 1 second update
Reactive Power (kVAR)	Reactive Power	+/- 2% of reading	Approx. 1 second update
Power Factor (PF)	Power Factor	0 to 1.0	

ATC-900 programmable set points

Option	Description	Range	Factory default
General settings			
—	Set new password	0000–9999	0900
—	Selected language	English, French or Spanish	English
—	Nominal frequency	50 or 60 Hz	As ordered
—	Nominal voltage	110–600V	As ordered
—	Number of phases	1 or 3	As ordered
—	Number of generators	0, 1 or 2	1
—	Preferred source	Source 1 or Source 2	Source 1
—	PT ratio	2:1–500:1	As ordered
—	CT ratio	200–5000	—
—	Daylight Saving Time	On or Off	1
—	Operating mode	Stand-alone/Master or Slave	Master
—	Phase sequence check	ABC, CBA or Off	Off
—	Commitment to transfer in TDNE	Yes or No	No
—	Manual retransfer	Auto, Manual or External	As ordered
—	Modbus address	1–247	1
—	Modbus baud rate	0 = 9600, 1, Even	9600
		1 = 9600, 1, Odd	—
		2 = 9600, 2, None	—
		3 = 9600, 1, None	—
		4 = 19,200, 1, Even	—
		5 = 19,200, 1, Odd	—
		6 = 19,200, 2, None	—
		7 = 19,200, 1, None	—
Transition settings			
47	Closed transition		
	Closed transition On or Off	On or Off	As ordered
	Closed voltage difference	1–5%	2%
	Closed frequency difference	0.0–0.3 Hz	0.3
32f/32d	Open—in-phase transition		
	In-phase On or Off	Disable, in-phase default to alarm, in-phase default to open transition	As ordered
	In-phase frequency difference	0.0–3.0 Hz	1.0
—	Synchronization timer	1–60 minutes	5
32a/32d	Open—delayed transition		
	Time delay neutral	0–120 seconds	0
	Load voltage decay	2–30% of nominal voltage	6%
Time delays			
1a	Time delay normal to emergency	0–9999 seconds	0:00
3a	Time delay emergency to normal	0–9999 seconds	5:00
35A	Time delay pre-transfer	0–120 seconds	0:01
35C	Time delay post-transfer	0–120 seconds	0:10
2A	Time delay engine 1 start	0–120 seconds	0:03
—	Time delay engine 2 start	0–120 seconds	0:03
4A	Time delay engine cool-off	0–9999 seconds	5:00
7A	Time delay engine fail timer	0–6 seconds	0:06
—	Voltage unbalance time delay	10–30 seconds	0:30

ATC-900 programmable set points (continued)

Option	Description	Range	Factory Default
Source settings			
26P	Source 1 undervoltage dropout	70–97% of nominal	80%
	Source 1 undervoltage pickup	(dropout + 2%) to 99% of nominal	90%
5P	Source 2 undervoltage dropout	70–97% of nominal	80%
	Source 2 undervoltage pickup	(dropout + 2%) to 99% of nominal	90%
26K	Source 1 overvoltage dropout	105–120% of nominal (0 = disabled)	115%
	Source 1 overvoltage pickup	103% of nominal to (dropout - 2%) (0 = disabled)	105%
5K	Source 2 overvoltage dropout	105–120% of nominal (0 = disabled)	115%
	Source 2 overvoltage pickup	103% of nominal to (dropout - 2%) (0 = disabled)	105%
26J	Source 1 underfrequency dropout	90–97% of nominal (0 = disabled)	94%
	Source 1 underfrequency pickup	(dropout + 1 Hz) to 99% of nominal (0 = disabled)	96%
5J	Source 2 underfrequency dropout	90–97% of nominal (0 = disabled)	94%
	Source 2 underfrequency pickup	(dropout + 1 Hz) to 99% of nominal (0 = disabled)	96%
26N	Source 1 overfrequency dropout	103–110% (0 = disabled)	106%
	Source 1 overfrequency pickup	101% to (dropout - 1 Hz) (0 = disabled)	104%
5N	Source 2 overfrequency dropout	103–110% (0 = disabled)	106%
	Source 2 overfrequency pickup	101% to (dropout - 1 Hz) (0 = disabled)	104%
26L	Source 1 percent for unbalanced voltage dropout	5–20% of phase-to-phase voltage unbalance (0 = disabled)	12%
	Source 1 percent for unbalanced voltage pickup	3% to (dropout - 2%) (0 = disabled)	10%
5L	Source 2 percent for unbalanced voltage dropout	5–20% of phase-to-phase voltage unbalance (0 = disabled)	12%
	Source 2 percent for unbalanced voltage pickup	3% to (dropout - 2%) (0 = disabled)	10%
Engine test/plant exerciser (PE1 and PE2 are independently programmable)			
6B	Engine test pushbutton on panel		
	Test mode	No load, load transfer, disabled	Load transfer
	Engine run test time	0–600 minutes	
23M	PE time delay normal to emergency	0–9999 seconds	1 minute
	PE time delay emergency to normal	0–9999 seconds	1 minute
	PE time delay engine cooldown	0–9999 seconds	5 minutes
	PE1/PE2 test mode	No load, load transfer, disabled	Disabled
	PE1/PE2 run time	0–600 minutes	30 minutes
	PE1/PE2 schedule	Off, daily, 7-day, 14-day, 28-day or calendar date (up to 12 user-specified dates)	
	PE1/PE2 calendar date	Month: 1–12; Day: 1–31	
	PE1/PE2 day of week	1 Sunday, 2 Monday, 3 Tuesday, 4 Wednesday, 5 Thursday, 6 Friday or 7 Saturday	
	PE1/PE2 plant start time	HH:MM AM/PM	
Accessory I/O			
—	Accessory I/O modules	0–4	—

ATC-900 programmable i/o

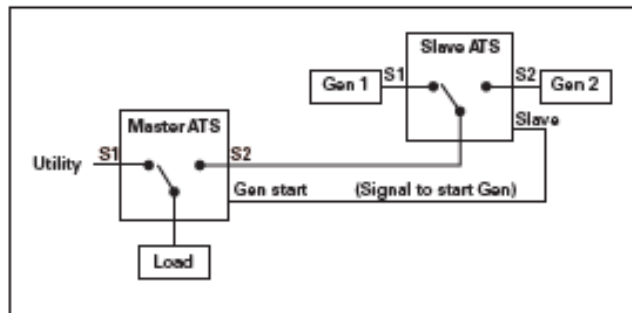| Description	Standard Quantity*	Maximum Quantity*	Functions
Input	4	20	• Monitor Mode • Bypass Timers • Lockout • Manual Retransfer On or Off • Manual Retransfer • Slave in • Remote engine test • Preferred source selection • Go to emergency • Emergency inhibit • ATS on bypass • Go to neutral
Output (control)	4	20	• Load sequence • Selective load shed • Load bank control • Pre/post transfer • Pre transfer • Post transfer • User remote control
Output (status/alarms)		20	• Source 1 available • Source 2 available • Source 1 connected • Source 2 connected • ATS not in automatic • General alarm • ATS in test • Engine test aborted • Cooldown in process • Engine start contact status • Generator 1 start status • Generator 2 start status • Emergency inhibit on • ATS on bypass

*4 inputs and 4 total outputs (control or status/alarms) are provided as standard. Additional I/O can be added by adding up to 4 external I/O module, each with 4 inputs and 4 outputs.

Three-source ATS Control

The ATC-900 Master/Slave controller functionality provides the user with the ability to use two independent transfer switches in three-source systems consisting of a utility and two generator sources. In a three-source system, the Master ATS controls the engine starting and stopping of the Slave ATS.

In the event of a Source 1 power failure, the Master ATS engine start relay closes signaling the Slave ATS to start both generators. (Note: The Slave ATS requires continuous power using either the DCT Module for a DC power input or a UPS input.) The Master ATS handles all transfer time delays between the utility to generator transfer. If the preferred generator does not start within the programmed time delay, the Slave ATC-900 will initiate a transfer to the non-preferred generator. If "None Preferred" is selected, then both generators will start and the Slave ATS will transfer to the first generator source available. The ATC-900 will sense the load is connected to a good source and shut down the second generator.

Three-source transfer switch arrangement